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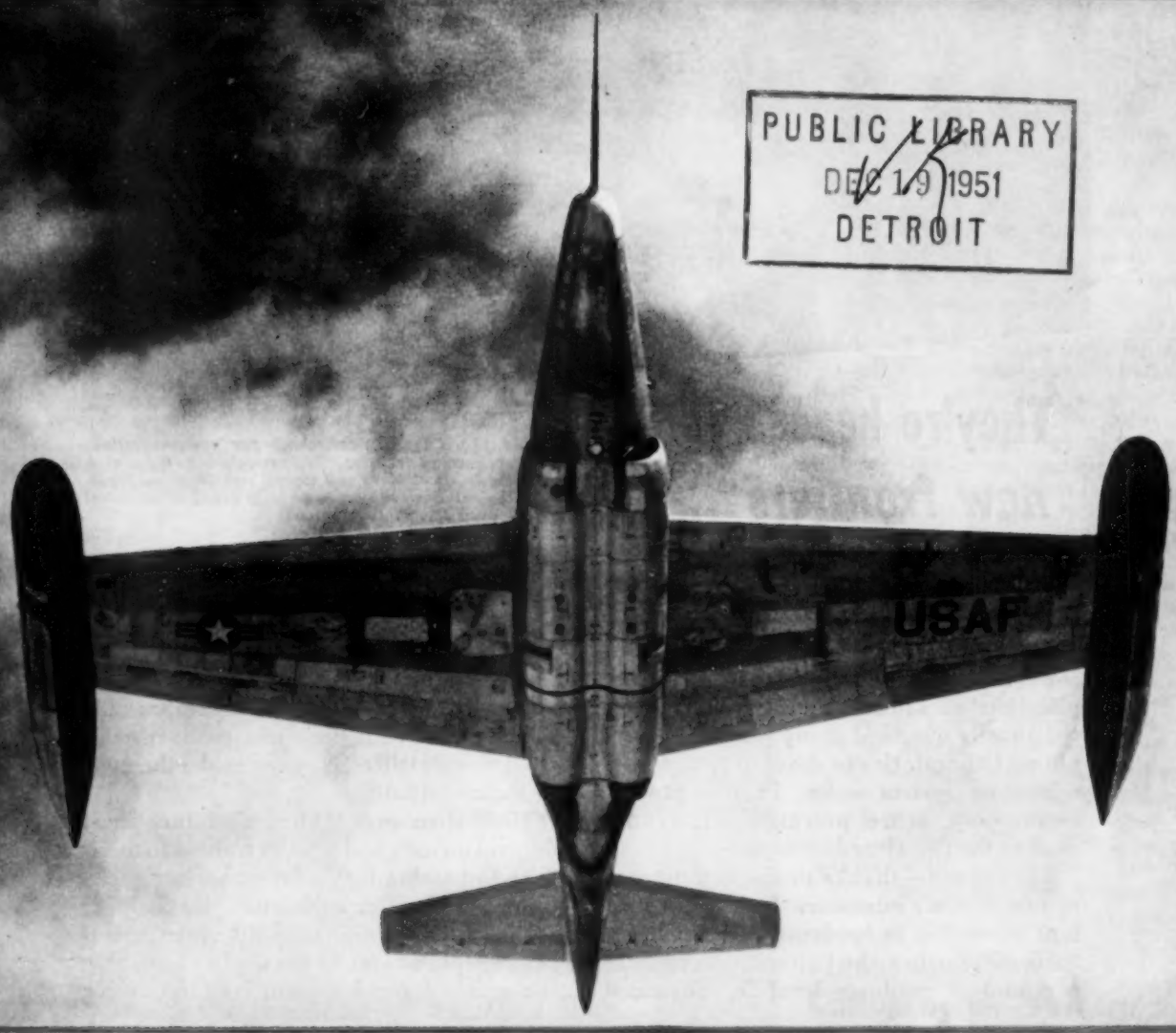
December 8, 1951

TECHNOLOGY DEPT.

# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

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## All-Weather Fighter

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VOL. 60 NO. 23 PAGES 353-368

# They're headed for *new frontiers*

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EACH year the Bell System selects hundreds of engineering graduates from technical schools, to find the answers to communications problems through the application of science and technology. A specifically qualified group joins Bell Telephone Laboratories to develop *tomorrow's* telephone system – also, in the present emergency, more powerful electronic devices for the armed services.

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*Exploring and inventing, devising and perfecting, for continued improvements and economies in telephone service.*

ASTRONOMY

# 17-Year Star Eclipse

**Record eclipse now in progress in southern sky will last another five or six years. Telescope needed to spot this unusual stellar event.**

➤ A RECORD star eclipse lasting 17 years is now in progress in the southern skies.

One star of a double star team started passing between us and its companion about 12 years ago. The eclipse will not end and the double star return to maximum brightness for another five or six years.

This is the longest eclipse on record, if calculations are correct.

The two stars, which in telescopes have always appeared as one, probably complete their swing around each other once every 200 years, the Rev. D. J. K. O'Connell of Riverview College Observatory, Sydney, New South Wales, estimates.

Usually two eclipsing stars swing around each other within a few hours, days or weeks. There are only seven other eclipsing double stars with periods longer than 1,000 days. Four of these take under 20 years to complete their swing, one takes slightly over 20 years, another some 24 years, and the seventh 40 years. This star probably has a period of 200 years.

The new double star is in the southern constellation of Centaurus, the centaur. A good telescope is needed to find it as it is normally of the ninth magnitude.

At maximum the eclipsing star is almost twice as bright as at the height of the eclipse. Stellar photographs taken throughout the past two decades show that the brightness of the star remained constant until about 1939. During the next eight years it dropped from magnitude 9.5 to magnitude 10.25.

The star is now getting brighter again, but will not return to maximum for another five or six years. If the eclipse is partial, it will last 17 to 18 years in all; if total, it will probably last longer, Fr. O'Connell reports in the MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY (Vol. 3, No. 1). To astronomers the star is known as C.P.D. -60 degrees 3278.

Science News Letter, December 8, 1951

TECHNOLOGY

## Rubber Containers May Supply Troops by Air

➤ ARMY FIELD troops may some day be supplied with gasoline, water and other liquids dropped to them in rubber containers now being tested at Fort Lee, Va.

Developed by the General Tire and Rubber Company, the five-gallon disks are made of synthetic rubber. It is believed that the special containers will prove more accurate for aerial delivery than parachute-rigged containers.

When dropped from altitudes of 200 to 2,000 feet, none of the rubber disks burst. When they hit the ground, the containers stretch to almost double their normal diameter of two feet, then bounce back into the air and settle down near the point of contact. Tests were conducted under the supervision of Henry G. Alley, Jr., of the Army's Quartermaster Board.

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*DROPPING LIQUIDS—Before loading for test drops, three engineers check the experimental 5-gallon synthetic rubber containers planned for aerial supply of varied liquids. At right can be seen a standard container.*

METEOROLOGY

## Half of Nation to Have Warm December

➤ WHETHER SANTA Claus has snow and cold weather for his annual rounds this month depends on what happens to a very deep low pressure area in the Gulf of Alaska.

Such a low pressure area largely prevents the cold temperatures of the Arctic from getting much below the Canadian border. It speeds up the westerly wind currents, sending storms scurrying over Canada and bringing in warm Pacific air behind them. If the low persists throughout the month we will have a warm, dry December over most of the nation.

However, the Weather Bureau's extended forecast section points out that lows like this are delicate and sensitive. They can disappear for short periods of time, allowing the cold blasts to come down from the north. Therefore, it is predicted that, while the southern half of the nation and the Pacific Northwest can expect temperatures to average above the seasonal normal, the northern plains, the Great Lakes regions and the Atlantic seaboard can expect large week-to-week fluctuations in temperature. These fluctuations, they say, should average out for the month to about normal.

Snow will be below normal over the Rocky Mountain states and the northern plains. The eastern half of the nation can expect about the usual amount of snow and rain, while only the West Coast states will receive more precipitation than usual.

Science News Letter, December 8, 1951

INVENTION

## Patent Answer to Catsup Bottle Problem

➤ JOHN C. LOWE, Jr., Youngwood, Pa., thinks he has the answer to what to do about the catsup bottle. He has received patent 2,572,167 for his invention which is called a catsup dispenser. It is an auxiliary closure and dispenser which is stuck on the top of catsup bottles. It excludes the air which causes the catsup to dry and clog the neck of the bottle.

Science News Letter, December 8, 1951

PSYCHOLOGY

# Toys Help Child Learn

➤ FOR THE children on your Christmas gift list, select toys with care. Of course, you want to give safe toys, so avoid any with lead paint, sharp pointed toys for young children, toys small enough to be swallowed in the case of babies and small children who will put things in their mouths.

Remember that a child learns and develops through his play. One authority on the subject advises giving the child a well balanced diet of toys and play equipment to help him to good all round development. The four main courses on this balanced toy diet are:

1. Active physical play. Push and pull toys, wheel toys, balls, sports and gym equipment are typical playthings which aid physical development.

2. Manipulative, constructive, creative play. Blocks, construction toys, drawing and painting equipment and hobby kits are typical aids to this type of play. Such play is important because it gives opportunity for expression of ideas, for trying out all kinds of new ideas. It allows for the use of initiative, stimulates observation and develops resourcefulness.

3. Initiative, imaginative, dramatic play. Dolls, housekeeping equipment, train systems and dress-up costumes are typical of the kind of equipment which stimulates imitative and dramatic play. This type of play also encourages imaginative expression and helps the child to understand the world around him through imitating and dramatizing adult activities.

4. Social play. Games in which several children can take part are essential aids to social development. By sharing play activity, children learn a great deal about how to get on with each other. They acquire basic understanding of fair play and good sportsmanship. They learn the value of concentrating and thinking quickly and accurately.

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VETERINARY MEDICINE

# Fight Rabbits with Virus

➤ THE RABBIT, world-wide menace to agriculture, is now being successfully attacked in Australia by artificial infection with an American virus which causes a deadly rabbit disease, myxomatosis.

Introduced into the Australian wild rabbit population by means of spring traps with virus-smeared prongs which cause infected punctures without otherwise hurting or restraining them, the virus has already spread over some 100,000 square miles of territory in New South Wales, where it is killing large numbers of the pest.

The virus is carried by mosquitoes and other bloodsucking insects from infected animals to healthy ones.

As this is reported by Sir Frank Burnet, internationally known Australian virus expert, to be the only recorded instance in which a man-planted disease has spread among wild animals, it may have the greatest economic significance in the control of rabbits and other destructive animal pests.

Myxomatosis was first discovered in South America as a disease of tame rabbits and scientists have since been attempting to exploit it as a means of controlling wild ones. Early attempts resulted only in mild local outbreaks among infected wild rabbit populations, this being the first time that the disease has spread far and wide as a virulent infection.

Australian scientists are now waiting to learn whether the virus has survived the Australian winter and will reappear now that spring is bringing out a new crop of mosquitoes down under.

The report on this work appears in the agricultural journal WORLD CROPS.

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# Question Box


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How does snow help to make bread? p. 365.

**MEDICINE**

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**METEOROLOGY**

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**ZOOLOGY**

What is missing link between flying and flightless birds? p. 358.

How have two animals shown that the Midwest was much drier 10,000 years ago? p. 359.


**Photographs:** Cover, Northrop Aircraft Co.; p. 355, U. S. Army; p. 357, American Optical Co.; p. 359, University of Arizona; p. 362, Fremont Davis.


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## ● RADIO

***Saturday, Dec. 15, 1951, 3:15-3:30 p.m. EST***

**"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.**

**Rear Admiral Luis de Florez, president, de Florez Engineering Company, New York, will discuss "Developing New Ideas."**

MEDICINE

## Parents Alerted on Tumors in Children

➤ STATEMENTS ALERTING parents to the fact that babies and children can have tumors and even cancer were made by two physicians at the meeting of the American Medical Association in Los Angeles.

Many babies with persistent vomiting in the early weeks of life have a small tumor in the lower end of the stomach, Dr. William H. Snyder, Jr., of the University of Southern California Medical School said.

These can be cured with comparatively simple surgical operations. Surgery for infants and children is safe and effective today, he explained, because of advances in medical understanding of water, salt and protein needs, the effective use of blood to prevent shock, the advances in anesthesia and the availability of potent drugs to prevent infection.

A mother who notices a progressive enlargement of the abdomen of her child should have him undergo a complete physical examination, Dr. Theodore R. Fetter of Jefferson Medical College, Philadelphia, advised.

"The appearance of a mass in the abdomen, usually on one or the other side, should be considered a possible tumor until proved otherwise. Prompt recognition often will save the life of the child."

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MEDICINE

## Blood Pump Saves Lives By Forced Transfusions

➤ A BLOOD pump that promises to be life-saving for a person who has lost almost all the blood in his body has been developed by Jan Petri of the American Optical Company in Southbridge, Mass.

The new device can pump a pint of blood into veins or arteries within one and one-half minutes. It takes 40 minutes to drip the same amount of blood into the patient by the gravity method of the usual blood transfusion.

If the patient has lost three pints of blood, it is not possible by the gravity method to replace the lost blood fast enough to catch up with the deteriorating process that within five minutes can produce permanent damage in the brain deprived of blood and its oxygen.

Science News Letter, December 8, 1951

ANTHROPOLOGY

# Why Indians Use Peyote

**Five anthropologists urge that use of peyote by Indians not be included in the current national campaign against illegal use of narcotic drugs.**

➤ THE CURRENT national campaign against illegal use of narcotic drugs should not be directed against the use of peyote by Indian tribes, five anthropologists declare in a statement to the journal SCIENCE (Nov. 30).

"Peyote is used sacramentally in a manner corresponding to the bread and wine of white Christians," they state.

The scientists issuing this protest against current propaganda to have peyote declared illegal are: Dr. Weston La Barre of Duke University, Durham, N. C.; Dr. David P. McAllester of Wesleyan University, Middletown, Conn.; Dr. J. S. Slotkin of the University of Chicago; Dr. Omer C. Stewart of the University of Colorado, Boulder, Colo., and Prof. Sol Tax of the University of Chicago.

The idea that peyote is narcotic, intoxicating and used for immoral orgies is false, say these anthropologists who have themselves made extensive studies of Peyotism, participated in the rites and partaken of the sacramental peyote.

Peyote is a small, carrot-shaped, spineless cactus which in the United States grows in the Rio Grande Valley. When the peyote "button" is taken internally, it appears to have "remarkable mental and physical effects, although these have not been thoroughly studied," the anthropologists state.

"Peyote does not excite, stupefy, or produce muscular incoordination; there is no hangover; and the habitual user does not develop any increased tolerance or dependence."

Peyotism is a religion, the scientists explain, with a national intertribal organization incorporated under the name, The Native American Church of the United States. Its modern form is Christianity adapted to traditional Indian beliefs and practices.

Followers of this religion believe that God put some of His Holy Spirit into peyote which he gave to the Indians.

"The Native American Church of the United States," the scientists declare, "is a legitimate religious organization deserving of the same right to religious freedom as other churches."

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***BLOOD TRANSFUSION PUMP—This life-saving device which speedily pumps large quantities of blood, plasma or plasma substitutes into people dying from loss of blood, can force a pint of blood into veins or arteries within one and one-half minutes.***

METEOROLOGY

# Selecting Factory Sites

**Weather should be considered in making selection of manufacturing plant sites. Wind pattern particularly should be examined.**

➤ WEATHER IS an important factor to be given full consideration in selecting a site for a manufacturing plant that may add pollutants to the atmosphere, the American Society of Mechanical Engineers meeting in Atlantic City was told by Dr. Frederick G. Sawyer of Stanford Research Institute, Calif.

Location of a plant where weather conditions are unfavorable to pollution concentration may save the owners the cost of damage suits later. The time has come, he said, when, in addition to the usual considerations such as proximity to raw materials, water, transportation and labor, the weather must also be considered as an important factor.

The most important feature of the weather to be taken into consideration, he indicated, is the wind pattern. The wind should be examined for direction, velocity, seasonal variation, diurnal changes, and seasonal change in daily patterns. Storm pattern and frequency should be studied. A location which is subject to frequent storms is inimical to air pollution nuisance or damage, Dr. Sawyer said.

Los Angeles, noted for its "smog," was cited as an example of an area where air pollution is due in large part to weather conditions.

"Los Angeles is not a smoky city by eastern standards," Dr. Sawyer said. "Almost no coal is burned so that soot and flyash are not major problems. As in other cities, there are thousands of different emissions of gases, solid particles and liquid droplets. What makes Los Angeles different is the meteorology and topography which combine to accentuate the effects of pollutants present."

The pollutants arise in a basin confined by mountains on three sides. Seasonal weak winds fail to move the polluted air out of the basin. A blanket of warm air, known as the inversion layer, acts as a lid over the basin for a large part of the year. When this layer descends to from 500 to 1,500 feet elevation, the pollutants are crowded close to the earth and smog results.

Science News Letter, December 8, 1951

PHYSICS

# Proton Beam Studied

➤ EXPLANATION OF the aurora and new information on what happens to atomic fission fragments are expected to result from experiments reported to the American Physical Society meeting in Houston, Tex., by Dr. S. K. Allison of the University of Chicago.

Beams of hydrogen atom hearts, or protons, from a high energy accelerator were studied by Dr. Allison when they shot out into the air.

The protons eventually become slowed down, capturing electrons, the negative electrical particle, from the molecules of the air. This makes them become ordinary hydrogen atoms and they are indistinguishable from the minute amount of hydrogen already present in the atmosphere.

Dr. Allison found that this picking up of electrons by the protons is a fluctuating process. An electron is picked up by a fairly fast proton, moves along with it for a while and then is scraped off. After some time, the proton again captures an electron which, since the proton is now slower, stays on for a longer time. Eventually the proton moves so slowly that a captured electron is permanently retained.

Such captures and losses are extremely prominent in the slowing down of fission fragments and the experiments on atomic beams are expected to give basic information in understanding this important atomic action.

The light of the aurora or northern lights may be emitted when protons ejected by the sun begin to capture electrons as they slow down in the earth's atmosphere. For this reason, Dr. Allison's experiments may help us understand these displays in the night sky.

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ZOOLOGY

## Find Missing Link Between Flying and Flightless Birds

➤ THE MISSING link between birds that fly and flightless birds may be a curious fossil, found in Switzerland in 1936, Dr. Alexander Wetmore, secretary of the Smithsonian Institution in Washington, says.

He has just completed a revised classification of the birds of the world, and has elevated the fossil bird to the status of a separate zoological family. (See SCIENCE NEWS LETTER, Nov. 17, p. 319.) Dr. Wetmore concludes that the ostrich had flying ancestors. These heavily plumaged birds are believed to come from a family of fossil birds that lived in Europe about 60,000,000 years ago, during the Eocene geological period.

Oldest of "birds," known from fossils dating back to the days of the dinosaurs, are the archaeopteryx and the archaeornis. They were flying lizards as much as true birds, but are considered as ancestors to birds because they had feathers.

One group of zoologists has contended that one of the flying lizards was the ancester to flying birds, and the other was ancestor to flightless birds. Another group has held that one was an immature form of the other. Actually neither contention holds, Dr. Wetmore says, as the differences are so great that they cannot be considered as belonging to the same zoological family.

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NUTRITION

## Diet for Child Who Is Overweight

➤ TO PARENTS who constantly struggle to put weight on a skinny child or to get their child to eat instead of picking at his food, it may be surprising to learn that some children eat too much and are so fat that they have to be put on a diet.

The question of whether a child is too fat should of course be decided in consultation with the family doctor or child specialist. Some fat children slim down naturally when they reach their teens.

But this happens in only about one-third of the cases and it is a mistake to wait for this period, says Dr. William A. Reilly of Little Rock, Ark. In a report to GP, medical journal published by the American Academy of General Practice, he says that age six is not too soon to start weight reduction of an obese child.

Diet is the most important part of the treatment, he says, though exercise is also important and in some cases he gives some weight-reducing drugs. About three-fourths of the children who stay with the diet and other treatment get down to fairly normal weight in three to six months.

A reducing diet for a child, particularly, should be prescribed by a doctor, to make sure the youngster is getting the necessary vitamins, minerals and protein for growth and development. In general, the diets Dr. Reilly gives follow the lines of those given by doctors to grown-ups who need to reduce.

For example, sugar, honey, jelly, jam, candy, syrup, chocolate, cocoa and fried foods are banned. So are bread, crackers, rolls, biscuits, muffins, potatoes, fresh peas, lima beans and baked beans, corn, parsnips, noodles, macaroni, spaghetti, and rice.

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*ARCHAEOLOGY COLLECTIONS—Covering the entire prehistoric period in the Southwest, are the Gila Pueblo archaeology collections, more than 10,000 pieces of pottery, stone, bone, tools and weapons, and other artifacts. The exhibition in the Arizona State Museum has just been opened to the public.*

ASTRONOMY

# 44 New White Dwarf Stars

**New discoveries bring to nearly 150 the number of white dwarfs now known. Cubic inch of one such star, brought to earth, would weigh a ton or more.**

➤ FORTY-FOUR NEW white dwarf stars in the southern skies have just been reported by Dr. Willem J. Luyten of the University of Minnesota, Minneapolis. This brings to almost 150 the total number of known white dwarfs, small stars with intensely hot surfaces.

These peculiar stars are noted for their great density. A cubic inch of one of them, if brought down to earth, might weigh anywhere from one to a thousand tons.

These stars are genuine dwarfs in every respect. Some are as small as our moon. They give off relatively little light, which makes them hard to find. It would take about 10,000 of the average white dwarfs to give off as much light as our sun. They shine with a light much whiter than that of the sun, and often even blue in color.

The stars were found by observing on plates borrowed from Harvard Observatory the color of some 16,000 stars that seemed to move around in the heavens more than their neighbors. Most of the stars were red, but some 800 were singled out as definitely bluer than expected. Further study indicated that 44 were probably white dwarfs, Dr. Luyten reports in the PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES (Oct.).

The first of these stars ever discovered was found because of little erratic shifts in the motion of Sirius, the brightest star in the sky. This star is so small that it is only a little larger than the earth. In volume, it is 40,000 times smaller than the sun, yet within that small space is packed just as much matter as there is in the sun itself. This makes the star so dense one cubic inch would weigh about 2,500 times as much as the same amount of gold.

In these stars astronomers are dealing with matter in the raw. Heated to terrific temperatures, perhaps billions of degrees, all the atoms are "stripped" of their protective covering of electrons. This makes the atoms so much smaller it is possible to "pack" them much closer together.

The discovery and explanation of these stars caused a minor revolution in astronomical thinking.

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## On This Week's Cover

➤ STREAKING ACROSS California's sky in the 600 miles-per-hour class is the newest all-weather interceptor, the F-89D, shown on the cover of this week's SCIENCE NEWS LETTER. Nearly as large as World War II medium bombers, its gross weight, including fuel and armament, is over 40,000 pounds. The Northrop Aircraft plane is equipped with rockets, electronic aiming and automatic triggering equipment, enabling the pilot to direct his fire with great accuracy.

PUBLIC HEALTH

## Citizens' Committee Plans Helping Hospitals Pay Bills

➤ NEEDED: A PLAN to help hospitals meet their bills as Blue Cross and similar plans help patients pay their hospital bills.

The rising costs of everything have hit the hospitals, like the rest of us. All of them, except proprietary hospitals, go in the red and must pass the hat at the end of each year to make up their deficits.

With the hope that something can be done about this, so that hospitals can continue to give high quality care at the lowest possible cost to the patient, a citizens committee of 30 national leaders has met in Washington.

They call themselves the Commission on Financing of Hospital Care. Gordon Gray, president of the University of North Carolina and former Secretary of the Army, heads the group.

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ZOOLOGY

## Frog and Turtle Remnants Of Drier Midwest Long Ago

➤ THE MIDWEST was much drier 10,000 years ago than it is now. That is the conclusion of Dr. Philip W. Smith of the Illinois Natural History Survey in Urbana from a study of new species of mud turtles and of chorus frogs of western Illinois' sand prairies.

Both these animals have now been found for the first time three to four hundred miles farther east than usual. Dr. Smith considers them survivors of a time when western Illinois was a prairie peninsula. Since both the turtle and the frog are subspecies of animals found on the Great Plains, Dr. Smith believes that the present specimens are remnants of subspecies that were formerly widespread. Dr. Smith reports in the BULLETIN OF THE CHICAGO ACADEMY OF SCIENCES that the frog has been named *Pseudacris streckeri illinoensis* and the turtle, *Kinosternon flavescens spooneri*.

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AERONAUTICS

## Spoken Words Will Identify Aircraft Radio Ranges

➤ SPOKEN WORDS uttered automatically and almost continuously are to be used soon to identify to pilots of aircraft certain of the stations that provide the radio ranges to guide them on their courses. They will not replace the three-letter Morse code identification now used but will alternate with them.

This voice identification will prove of considerable help to pilots who have a limited knowledge of the Morse code. In the case of a strange station with code identification only, the pilot must look up the three-letter identifier in a guide to be sure what range he is receiving. The voice transmission makes this unnecessary.

To provide this voice identification, the U. S. Civil Aeronautics Administration, which operates the radio ranges and controls traffic on the airways, developed a voice reproducer which is nicknamed the "baby blabbermouth" because it never stops talking.

First, the voice is recorded on film. Then the device utilizes a transparent plastic fixed to the rim of a wheel. When the wheel is rotated slowly, a light shines through the film onto a photo-electric eye. This eye translates the variation in the light received into the voice.

Voice reproducers are now being installed at 19 widely distributed centers where the new type of very high frequency omniranges have been installed. They are also being installed in connection with 11 so-called fan markers. These fan markers are radio stations a few miles away from airports that shoot a sheet of radio rays vertically into the air. They give warning to pilots of distances to the airfields they are approaching.

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MEDICINE

## Selenium and Sulfur New Dandruff Treatment

➤ GREASY, YELLOWISH scales on the scalp and common dandruff can be checked in most cases by an electric eye chemical, selenium, plus sulfur, longtime standby for treatment of scalp and skin disorders.

Selenium sulfide's ability to control dandruff and the scaly itching scalp condition termed medically seborrheic dermatitis was discovered some 25 years ago. In the interval the chemical has been given many tests and trials and now Abbott Laboratories, North Chicago, Ill., announce a selenium sulfide product for medical use called Selsun.

Because selenium is poisonous when swallowed, the scalp remedy will be sold only on a physician's prescription. Tests have shown that it is not harmful when used on the scalp according to the doctor's directions.

The original discovery of the chemical's anti-dandruff power was suggested by Dr. Birger W. Nordlander, research chemist at General Electric Co., who fused selenium with sulfur to get a chemical that would detect mercury vapor in the air. Because this product was a very active form of sulfur and knowing that sulfur had long been used for treating skin diseases, Dr. Nordlander suggested its medical use to Drs. B. L. Vosburgh and Glenn Smith of General Electric's medical department.

While it proved successful, General Electric did not want to continue producing it for medical use. A research and testing program was carried out under the auspices of the Battelle Memorial Institute at Columbus, Ohio. Abbott Laboratories assumed the final development.

Their product is reported to control 92% to 95% of cases of mild or common dandruff, and 81% to 87% of seborrheic dermatitis. The chemical, however, is not a cure. When its use is stopped, dandruff will eventually come back.

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PUBLIC HEALTH

## Food Poisoning Is Year Round Danger

➤ FOOD POISONING outbreaks in five different communities have recently been reported to the U. S. Public Health Service. In one of them two persons of a family of five, the mother and 15-year-old son, died, victims of botulism. They got the deadly botulinus germs in home canned asparagus.

In another outbreak, six persons out of a group of 15 were very ill shortly after drinking lemonade which had been made and stored for five hours in a silver plated pitcher. The copper alloy base in the pitcher was exposed and when lemonade was made in the pitcher in the laboratory, 82 parts per million of copper were found in the lemonade.

Hamburger, ham patties, turkey which presumably had not been properly roasted and homemade ice cream were the foods involved in the other outbreaks. In these cases the poisonings were caused either by germs in the foods or by germ poisons, called toxins, produced in the foods.

Germs usually involved in food poisonings are members of the staphylococcus family which also cause boils.

These germs thrive especially well in such foods as cream filled pastries, ham or other meat preparations, chicken, fish, eggs, and salad sandwich mixes made with mayonnaise. The germs also thrive well at room temperature. They get into the food when someone preparing or otherwise handling it has a boil or an infected cut finger, or who may have a cold or diarrhea.

If this food is kept clean, and cold or very hot until eaten, it is not likely to cause food poisoning.

Science News Letter, December 8, 1951

# IN SCIEN

METALLURGY

## Conserve Lead Supply by Metal Bonding Process

➤ AMERICA'S PRECIOUS supply of lead can be made to go farther, particularly in sulfuric acid manufacture, through a new metal bonding process exhibited by Knapp Mills for the first time at the Chemical Industries Exposition in New York.

A thin layer of lead is bonded upon steel to make it resistant to acid corrosion. In another metal combination, copper is clad with lead and the new material has lead's acid resistance and copper's high electric conductivity and heat transfer.

In making sulfuric acid, which is in critical need in industry and defense production, the new lead-clad metals are expected to release many thousands of tons of pure lead for other uses.

The lead-clad copper will allow the use of freon instead of water in coils in which acids are cooled. It will also allow increasing ten-fold the electrical charge in electroplating.

The stronger base metals used will allow the application of acid-proof metal to many uses that pure lead itself cannot fill.

The lead-clad steel is produced by an automatic process patented originally by the American Viscose Corporation for use in rayon manufacture, while the lead-clad copper is made by a process developed by Knapp Mills that draws lead and copper simultaneously and chemically bonds them together.

Science News Letter, December 8, 1951

INVENTION

## Holster to Reload Water Pistol Patented

➤ THE BATTLING "COWBOY" with a water pistol will be able to reload his gun without leaving the arena of action with a water-carrying holster on which a patent has been issued.

The holster resembles the familiar types long used by youngsters but this has a flat water compartment made of a suitable plastic on its rear side. A tube at the bottom of the water compartment is used to refill the gun. Another tube at the top is used to refill the compartment when the ammunition is gone. The pistol is not exactly a "repeater" but it can be reloaded on the field of action. Frequent trips to the kitchen sink are no longer necessary.

Inventors are William E. Lawson, Jr., and William E. Lawson, Sr., Rahway, N. J. Patent 2,576,231 was their award.

Science News Letter, December 8, 1951

# ENE FIELDS

ENGINEERING

## New Styrene Plastic Has High Impact Resistance

➤ A NEW styrene plastic, which has high resistance to blows and other impacts, is becoming widely used in refrigerators, replacing sheet metal. It probably will be widely used in water pipes and drainage systems, the American Society of Mechanical Engineers meeting in Atlantic City was told by Sanford E. Glick and C. H. Adams, Monsanto Chemical Company, Springfield, Mass.

The development of new and large injection molding equipment makes the future of this new class of thermoplastics bright, they stated. Future items to be produced with the present and anticipated materials will include plumbing fixtures, turrets and hoods, bread boxes, septic baths, gun mountings and office furniture.

Styrene is one of the hydrocarbons that in recent years has been used principally in the manufacture of GR-S or Buna-S synthetic rubber. Styrene plastics have been in use for several years. This new high-impact styrene is much tougher than general purpose styrene.

Many uses for a new class of materials, commercially workable rigid thermoplastic resin rubber blends, were described by E. S. Ebers, B. W. Bender and Thomas R. Grimes of the United States Rubber Company. These resin rubber blends, they stated, have toughness at good rigidity, are easily shaped into various forms, are stable dimensionally and have good chemical and stain resistance.

Applications range from use in television tube masks and refrigerator parts to crash padding and chemical piping where corrosion resistance is required. The material is available in various forms for various uses. It is called a versatile product because of its many uses.

Science News Letter, December 8, 1951

NUTRITION

## Appetite Appeaser For Weight Reducers

➤ THOSE OF you who are trying to lose weight may find it easier to stick to your diet if you take a de-appetizer instead of an appetizer before lunch and dinner.

More correctly, the de-appetizer should be called an appetite appeaser, since it does not spoil your appetite, but takes the edge off, so that you will not eat more than your diet calls for at the next meal. Of course, the appetite appeaser should not itself add too many calories.

Orange and grapefruit juice, fresh, canned or frozen, can be used effectively for this purpose, Dr. Norman Jolliffe and Elmer Alpert of the New York City Department of Health report.

In their study, the would-be weight reducers were told to take four ounces of either orange or grapefruit juice half an hour or an hour before lunch and at the same time before dinner in the evening. Most people like the citrus juice and it is easy to get at home or at a soda fountain or lunch counter. This adds 100 calories to the diet. It supplies a little sugar naturally present in the fruit. This helps to fight off the low blood sugar and consequent low feeling that many have toward the end of the morning or afternoon, especially when on a low calorie reducing diet.

The orange or grapefruit juice appetite appeaser was tried on 42 overweight people who were on a high protein reducing diet that furnished 1,000 to 1,400 calories in addition to the 100 from the appetite appeaser. The eight men and 34 women returned for at least four consecutive weeks to have their weight loss checked.

Their success in sticking to the diet after they started taking the appetite appeaser was rated as 78.8% of a perfect score. The doctors call this "a high degree" of sticking to the diet. Their performance was calculated by comparing their actual weight loss with that predicted for them on the basis of the calories in the diet prescribed and the estimated calories they spent on daily activities. The predicted total weight loss for the 42 was 786.7 pounds. The actual weight loss was 603 pounds, giving a performance index of 76.6, with an average for the individual of 78.8.

Science News Letter, December 8, 1951

INVENTION

## Metallic Lens Antenna Aids TV Transmission

➤ A METALLIC lens antenna, one of the type that now makes it possible to send television programs across the continent, has been awarded a patent. Lenses of this type gather up scattering radio waves falling on them and focus them into a beam which may be amplified and directed on to the next relay station.

Inventor is Winston E. Kock, Middletown, N. J., and the patent received was number 2,576,463. Rights have been assigned to Bell Telephone Laboratories, Inc., New York.

Lenses of this type consist of a series of thin flat metal plates standing on edge and extending in the direction of the wave transmission.

Front and rear of the parallel plates are trimmed so that their edges define a curved surface. As described by the inventor, in this lens one of the sides has in a given plane an elliptical contour, and the other side has in a plane perpendicular to the first a hyperbolic contour.

Science News Letter, December 8, 1951

BIOLOGY

## Bare Legs Keep Chickens Cool

➤ MOST BREEDS of chickens are bare-legged to keep cool.

Prof. Wilbor O. Wilson of the University of California's College of Agriculture at Davis finds that combs and wattles also help the birds cool off when temperatures go up.

Chickens do not perspire as do humans, but depend on loss of heat through these parts to maintain an even body temperature.

The shanks, combs and wattles lose heat in trying to stay at the same temperature as the surrounding air. They are always just a few degrees higher than the air, but still lower than the body temperature of the chicken.

Science News Letter, December 8, 1951

METEOROLOGY

## India Location Holds Records for Rainfall

*"Rain, rain, go away.*
*Come again some other day.*
*Little Johnny wants to play."*

➤ THERE ARE some spots in the world really entitled to chant that ditty. Take, for instance, Opid's Camp, Calif., and Cherrapunji, India. Opid's Camp holds the world's record for the greatest amount of recorded rain in one minute—.65 inch—and Cherrapunji holds the record for the greatest amount over a period of two years—1,605.05 inches, about equal to the height of a 12-story building.

If it had rained steadily for two years at Opid's Camp at that same rate of .65 inch a minute, Opid's Camp would have been drowned under more than 10 miles of rain. Cherrapunji, therefore, doesn't know how lucky it is.

The U. S. Weather Bureau has issued a chart showing what places hold the world's record for amounts of rainfall over various periods of time. For rain over the longer periods, Cherrapunji seems to be the champion and no spot in the United States is in the running. Cherrapunji holds all but two of the 15 records from four days on up—Silver Hill Plantation, Jamaica, being its only competitor.

To Baguio, the summer capital of the Philippines, goes the palm for one day—45.99 inches. Thrall, Tex., must have been enthralled to have had 36.40 inches of rain in one 18-hour period. Smethport, Pa., holds two records, 30.8 plus for four hours and 30 minutes and 34.50 for 15 hours.

Guinea, Va., with 9.25 inches in 40 minutes, Holt, Mo., with 12 inches in 42 minutes, Rockport, W. Va., with 19 inches in two hours and 10 minutes and D'Hanis, Tex., with 22 inches in two and three-quarter hours are the only other American contenders.

Science News Letter, December 8, 1951

CHEMISTRY

# Spots Put To Work

**Little spots on a piece of paper help chemists analyze substances. Once separated, the chemicals can be cut apart with a knife or a pair of scissors.**

By MARTHA G. MORROW

➤ A LITTLE spot on a piece of paper is one of science's newest methods of chemical analysis.

Such little spots enable chemists to identify small quantities of exceedingly complex materials. They often permit scientists to separate chemicals that have been mixed together, and cut them apart with a knife or pair of scissors.

Let a drop of black ink fall on a piece of white absorbent paper and you have a black stain. But if you moisten the paper beforehand, or stick an end into water so it acts as a wick and draws water up through the spot, you will probably get several colored bands. This simple experiment gives you a pretty good idea of how this popular new method of chemical analysis works.

Color is the key-note to the new laboratory technique that is becoming so popular. Its name, paper chromatography, tells you how it works. "Chromatography" is derived from the Greek "chroma," meaning "color," and "graph," meaning "write."

The compounds identify themselves by colored bands or spots. Since one dye is carried by capillary action across the paper faster than another, the colors are soon separated.

After the materials have been separated on paper, they may be identified directly by their colors. If the solutions are colorless, chemicals may often be added to produce a colored compound to signal their presence. Occasionally the materials must be removed from the paper with solvents and chemically analyzed.

The individual dyes making up a green or brown ink may be seen directly when separated. A solution of milk sugar, dextrose or honey, however, is just as colorless as a solution of cane or beet sugar. But they can be distinguished by streaking their invisible chromatograms with potassium permanganate.

Often water is used to separate the mixtures, but sometimes water will not produce the desired results. Sometimes it is more satisfactory to use pure methyl or ethyl alcohol, isopropyl alcohol (rubbing alcohol), acetone (sometimes sold to remove fingernail enamel) or petroleum ether (fluid from a cigarette lighter).

The yellows and oranges in paprika, for instance, separate out well with petroleum ether, and the yellows and greens in leaves show up with isopropyl alcohol. But this new analytical technique is still in the trial-and-error stage with scientists experimenting to discover the best solvent to use with specific chemicals.

Powdered chalk, magnesia, alumina and diatomaceous earth are also good carriers for the chemicals. But paper is so simple and quick to use, it is usually preferred.

Filter paper is used by scientists because it is chemically quite pure. But many white papers found around your home or office can be used with relatively good success. Dip into water an end of typing paper, writing paper, paper towelling, paper napkin, toilet paper, tissue paper, and whatever other paper you find around to see which picks up water quickly without falling apart.

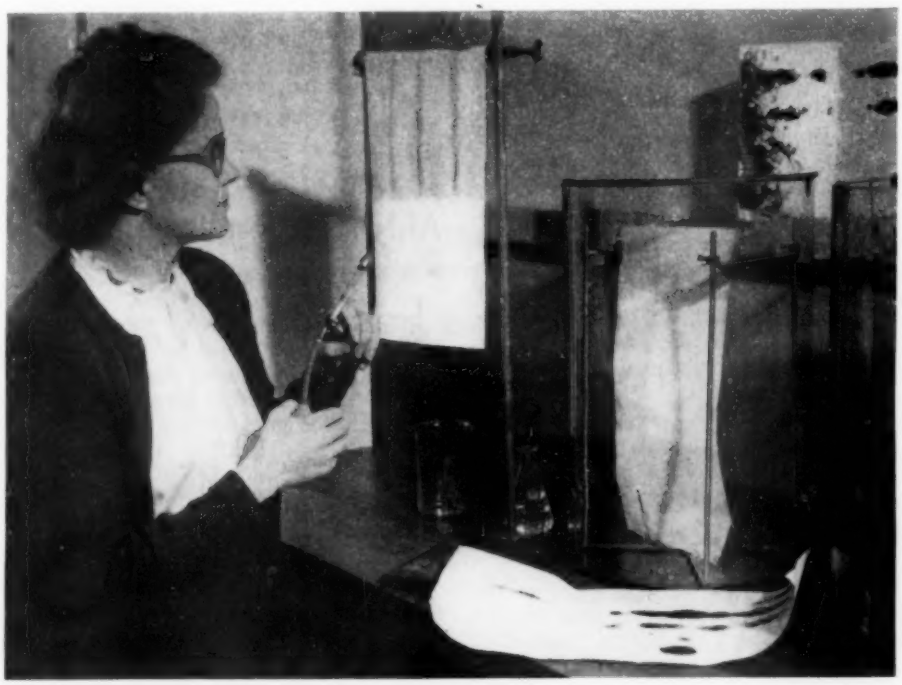
Now round up whatever dark inks you may have handy and try each in turn. First thoroughly moisten with water a piece of the paper that works best, then let a drop of washable black ink fall upon it. Does the ink separate into bands of green and red?

Washable ink is usually made black by combining complementary colors. India ink, on the other hand, is made of black carbon similar to the lead in your pencil, and a type of permanent black ink is made of iron tannate, a black compound.

## Black Ink from Colors

Red and green probably are not the only colors used to give your washable ink its black color. To discover whether blue and yellow were also used, mark a band of black about an inch from the bottom of a long strip of paper and stand it up in a glass with about a quarter-inch of water in the bottom. A wide chromatogram should result with the colors more distinct and farther apart than when the paper is wet first.

A good way to get a nice play of colors is to use a quart milk bottle. Make a diagonal slash about an inch or so from one end of your absorbent paper to give you a tiny "arm" to hook over the top of the bottle and keep it from slipping inside. Then if you put about a quarter inch of water into the bottom of the bottle, you have a nice long strip for the colored spot or band to move up.



*PAPER CHROMATOGRAPHY—Elaborate chromatographic cylinders are used under carefully controlled conditions to separate sugar mixtures on paper at the National Bureau of Standards. To develop colors, Dr. Emma McDonald is here shown spraying with alpha naphthol a paper on which sugar mixtures have been separated into their various parts.*

In working with paper chromatography, experts have learned not to let the colored part touch the water. When the band or spot itself is in the water, the color often leaches out and the experiment is spoiled. The color can move down the paper as well as up.

A square or round piece of paper works well when supported by the rim of a glass. If you cut a tab a quarter-inch wide nearly to the center of one of the squares, leaving the tab attached to the square, the tab will act as a wick when stuck in water. In this case the spot of color can be placed high on the tab, about where it joins the paper.

Another good trick is to cut a hole in the center of one of the squares and outline with ink or dye. A wad of cotton placed through the hole will draw the water up onto the filter paper so that the colors spread out.

Cut into one-inch squares a large quantity of the paper you found most satisfactory and pile one on top of the other until you have about 200 of them. Place four or five spots of ink on the 20th piece of paper from the bottom. Pile the squares in a jar, add water up to the 10th sheet and place a weight on top so they will be packed tightly together, each touching its neighbor at almost all points.

Screw on the top of the jar to prevent evaporation, but check from time to time to be sure there is still water on the bottom. When the top square has become moist, take out the paper pack and examine the layers.

This experiment demonstrates another technique used in paper chromatography. When performed under carefully controlled conditions, specific chemicals will often be found on separate sheets of paper.

After you have tried inks, experiment with vegetable dyes and water colors to see which ones are pure and which result from a wide mixture of colors. The fuzzy fibrous end of a paper match makes a good substitute for a paint brush.

The juice from beets or carrots is fun to separate into its various colors, as are bright autumn flowers. But again, water does not always make the best solvent in producing the colored bands.

Chromatography as a method of analysis was developed several decades ago by the Russian botanist, M. Tswett. But he used columns of powdered sugar with petroleum ether (lighter fluid) as a solvent. His experiments are now frequently repeated and the techniques he developed used again and again, but it is the simpler paper chromatography that is serving the chemist so well today.

*Papers saturated with brown and green water colors, and a generous supply of filter paper have been secured for you by* SCIENCE SERVICE *so you can separate these colors and the inks you may have around the house into the original colors from which they are made. Little packets of blue copper sulfate and yellow potassium ferrocyanide, which form a dark brown compound, are included in this kit along with full directions for experimenting with them. You can secure the experimental kit for the nominal fee of 75 cents. Write* SCIENCE SERVICE, *1719 N St., N. W., Washington 6, D. C., and ask for the Paper Chromatography kit.*

Science News Letter, December 8, 1951

MEDICINE

# ACTH Good for Trichinosis

➤ ACTH, HORMONE CHEMICAL famous for its anti-arthritis action, is good medicine for patients with trichinosis, Drs. Michael A. Luongo, David H. Reid and Woodrow W. Weiss of Boston and nearby Waltham report in the NEW ENGLAND JOURNAL OF MEDICINE (Nov. 15).

Trichinosis is the disease people get from eating wormy pork that is not thoroughly cooked. Symptoms are nausea, vomiting and diarrhea, lasting a few days. This is followed in a few days or a week or so by pain and tenderness of the muscles with fever and change in the blood cell picture. Swollen, painful eyelids also develop.

Three patients seriously sick with this disease showed "striking" improvement when treated with small doses of ACTH. In one patient, the temperature, which had been up to 106 degrees Fahrenheit, dropped to normal within four hours after the first dose of ACTH. The muscle pain and soreness and tired feeling also were promptly relieved.

Dramatic improvement of symptoms came quickly also in the other two patients. One man slept for the first time in 10 days.

ACTH is not labelled a "cure" in the report of these cases. Study of these patients and of guinea pigs given trichinosis in the laboratory did not show any change in the response of the body to infection with the worms. But the hormone chemical does help reduce the severe poisoning, or toxic, symptoms of the disease.

These symptoms, suggesting either the action of a poison or a severe allergic reaction, were what prompted the doctors to try ACTH. Another reason for trying it was the fact that in trichinosis certain white blood cells, called eosinophils, are greatly increased in numbers. Large numbers of these cells in the circulating blood are believed a sign that the adrenal glands are not producing enough hormone to meet conditions of stress. ACTH, from the pituitary gland in the head, stimulates the adrenal glands to produce more hormone. When the glands are able to respond to this stimulus, the number of eosinophils drops. This occurred in all three patients.

Science News Letter, December 8, 1951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MEDICINE

## Plan for "Cub" Doctors And Administrative Doctors

➤ MEDICAL STUDENTS will become "cub" doctors and after graduation can go on to study for administrative leadership in medicine, according to plans of two institutions in New York.

The "cub" doctor approach is Cornell University Medical College's new idea for teaching senior medical students in a new clinic for comprehensive medical care where they will learn medicine, pediatrics and psychiatry concurrently instead of in series.

The clinic, with its promise of better doctors and better care for patients, will be supported by a grant of $344,725 from the Commonwealth Fund which has currently set as its first goal better teaching of doctors. To reach this goal the Fund has made grants totalling over one million dollars out of the year's total appropriations of $2,879,383.99.

Training doctors to become administrators in hospitals, medical schools, public health departments, industries and prepayment medical care plans is the idea of the Institute of Administrative Medicine which Columbia University will begin operating about Jan. 1, 1952.

Science News Letter, December 8, 1951

INVENTION

## Canned Foods Sterilized Without Any Cooking

➤ WHOLE MILK and other foods used in the raw form can now be canned and sterilized, after the cans are sealed, by high frequency radio waves which will kill micro-organisms causing spoilage in such a brief time that the contents are not even partially cooked.

Ordinary canning, as is well known, consists of putting the raw food into metal cans, sealing the containers, then subjecting them to heat in a pressure cooker until the food is cooked and the bacteria killed by the heat.

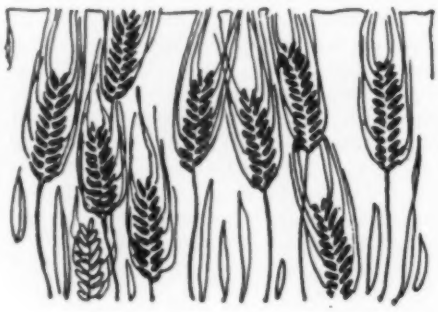
The process of sterilizing the food within the cans by high frequency electric energy requires means to get the radio waves inside to the food. The ordinary can, being made of metal, acts as a shield to radio waves to protect the contents. In this process regular stock cans are used but each has a small rod or tube soldered in an upright position to the inside center of the bottom. The lower end of this rod makes electric contact with the charging circuit. The result is irradiation of the interior.

Kenneth A. Smith, Burbank, Calif., and Arthur L. Grinnell, Los Angeles, received patent 2,576,862 for this process. Rights have been assigned to Electronic Chemical Engineering Company of Los Angeles.

Science News Letter, December 8, 1951

AGRICULTURE

## NATURE RAMBLINGS



### Bread from Snow

➤ A LARGE share of our wheat crop, and smaller proportions of other small grains, are fall-sown. The seed germinates soon after sowing and the young grain usually makes a good growth before cold weather arrives to check it. Then it stands, with its life-fires banked, until returning warmth in spring gives it leave to grow again.

Highly important, during these months of suspended activity, is the protection afforded by a good blanket of snow. Farmers feel at ease if they cannot see their wheat from December until March; if the green becomes visible through the white, they begin to worry.

Snow benefits winter grain in several ways. For one thing, although the white blanket does not keep things under it really warm, in terms of human comfort, it does maintain a somewhat higher temperature than that of the outer air. And what is perhaps of even greater importance, it prevents wide and rapid temperature swings such as take place outside.

The common figure of speech that likens snow to a blanket is really quite apt, despite its triteness. Snow influences temperature exactly as a good woolen blanket does: it interposes a mass of small, imprisoned air spaces between the object which it shelters and the cold of the outer air into which heat would otherwise be lost by radiation.

When snow is partly converted into ice by thawing and refreezing, it loses much of this insulating value—a glazed field is a field in danger.

Another useful function of snow cover is the protection it gives against evaporation. The atmosphere within a snowbank is very humid, so that the covered plants have little demand made upon their water content—precious because irreplaceable so long as the soil remains frozen and the roots are out of action.

While snow is over the ground, the restless "heaving" that comes when soil is alternately thawed and frozen is suppressed. When heaving takes place in an uncovered field, the exposed wheat plants are likely to have their roots torn off, and are often turned upside down in the bargain.

The final benefaction of a good snow cover comes with the spring thaw. Most of the snow water sinks slowly into the soil right where it is, becoming immediately available for the needs of the newly thirsty, rapidly growing plants. The abundance of July's harvest is thus determined in January.

Science News Letter, December 8, 1951

PUBLIC HEALTH

# Tuberculosis Is Curable

➤ WHEN YOU stick tuberculosis association Christmas seals on cards and gifts this month, make a note to have your own chest X-rayed if you have not had this done recently. If you are 15 years or older, you should have a chest X-ray every year, advises the National Tuberculosis Association.

"If you know that you have been exposed to TB, you probably should have check-ups more often than once a year," the association advice continues. "Your doctor can tell you what tests you should have. Children under 15 are not likely to have active tuberculosis, but doctors may recommend their examination in some circumstances.

"If the X-rays make your doctor suspect TB, he probably will recommend taking a complete set of tests.

"Doctors use a combination of three methods to find tuberculosis:

"1. The chest X-ray includes a picture of the lungs.

"2. The tuberculin test, a simple skin test which shows whether or not living TB germs are in the body.

"3. A thorough check-up, including medical history and laboratory tests."

Tuberculosis is curable, but the sooner it is found and treated, the better the chances for recovery. It is a germ-caused disease which you catch by breathing air with the TB germs in it (from the coughing, sneezing or spitting of a person who has it), by kissing someone with active TB and by putting in your mouth things that were not sterilized after being used by someone with TB.

Early tuberculosis usually gives no warning signs, which is why authorities advise regular chest X-rays to pick it up.

Science News Letter, December 8, 1951

DENTISTRY

# Water Fluoridation

**National Research Council joins dental and health authorities in favoring fluoridation of public water supplies. Proper control necessary.**

➤ ONE OF the top scientific organizations of the country, the National Research Council, now joins forces with dental and health authorities in favoring fluoridation of public water supplies to reduce tooth decay.

"Properly controlled, the addition of fluorides to drinking water which lacks these chemicals appears to be both safe and effective," states a report from the NRC.

Hailed by some as reducing dental decay by two thirds, and opposed by others as of questionable value and possibly dangerous, fluoridation has been the subject of controversies in many cities throughout the country. Last spring the NRC appointed a committee to study the evidence on both sides and give an impartial answer.

While endorsing fluoridation, the committee cautions that its safety depends on proper controls and its effectiveness on proper selection of water supplies for treatment. Among the points emphasized are these:

Fluoridation should be considered by any community which includes a child population of sufficient size, and which obtains its water supply from sources which are free from or extremely low in fluorides.

The actual reduction in dental caries will vary according to local conditions. The widely quoted figure of 65% is a prediction applying only to communities whose water contains no natural fluorides at all. Benefits in many cases would be much less.

Protection is gained chiefly by drinking fluoride-containing water while the permanent teeth are being formed, or up to about 12 years of age. However, this protection lasts to some extent into adult life.

There is no evidence that fluorides are harmful in the very small amounts (about one part in a million) needed to reduce caries. Probably 5,000,000 Americans drink water with this much or more every day. However, it should be undertaken only under expert dental and engineering supervision by the state board of health, with constant chemical control. Less fluoride should be added in warm climates where more water is consumed.

Fluoridation is only a partial caries control procedure and does not eliminate the need for other dental health measures.

About one half of the population of this country is rural and does not use public water supplies. Other provisions for preventing dental caries in this fraction of the population should be continued and developed.

Chairman of the committee is Dr. Kenneth F. Maxcy, The Johns Hopkins University School of Hygiene and Public Health, Baltimore, Md. The membership includes Dr. J. L. T. Appleton, School of Dentistry, University of Pennsylvania, Philadelphia; Dr. Basil G. Bibby, director, Eastman Dental Dispensary, Rochester, N. Y.; Dr. H. Trendley Dean, director, National Institute of Dental Research, U. S. Public Health Service, Bethesda, Md.; Dr. A. McGehee Harvey, The Johns Hopkins University; Dr. Francis F. Heyroth, Kettering Laboratory, University of Cincinnati College of Medicine, Ohio; Dr. A. LeRoy Johnson, Great Barrington, Mass.; former head of the Harvard School of Dental Medicine, and dental consultant, National Research Council. Prof. Harold A. Whittaker, University of Minnesota School of Public Health, Minneapolis; and Dr. Abel Wolman, The Johns Hopkins University.

Science News Letter, December 8, 1951

ENGINEERING

## Gas Turbine Engines Ideal For Gas Pipeline Pumping

➤ GAS TURBINE engines give promise of providing ideal power for use in long, large cross-country pipelines carrying natural gas from gas fields to consumers, the American Society of Mechanical Engineers meeting in Atlantic City was told.

One pumping station so powered is already in use and has completed a two-year test, T. J. Putz, Westinghouse Electric Corporation, Lester, Pa., reported. It is at Wilmar, Ark. It is the first such installation in the world, he said, and the first industrial gas turbine in the United States to operate on natural gas.

Its use will effect a saving in the cost of boosting the flow of gas through pipelines, particularly in the big pipelines which are 20 inches or over in diameter.

Gas turbine engines will use natural gas from the line being pumped, as do gas-fired reciprocating engines now employed, but are more efficient, he indicated, and require a lower capital investment.

The experience gained from the Arkansas installation "has proven this type of gas turbine is ideal for booster power," he declared. "The simplicity and small size allows for a simple low cost station, and it can readily be moved to various locations. It can be shut down for extended periods without the expense of providing special protection and can be later restarted in an exceedingly short period of time without difficulty."

Based on experience gained with this Arkansas 1800-horsepower, single-shaft unit, Westinghouse has designed and is building a 5000-horsepower dual-shaft gas turbine with regenerator.

Science News Letter, December 8, 1951

NUTRITION

## Add Kale to Your Winter Vegetables

➤ IF YOU are looking for a different vegetable but one which carries a good share of nourishing value, try kale. It is a good bet for winter menus, since it comes on the market at the season when other green leafy vegetables are scarce.

Studies of the nourishing value of this green, and of appetizing ways of cooking it, have recently been made at the Connecticut Experiment Station at Storrs, Conn. Kale rates high as a source of vitamin A and of two essential minerals, calcium, or lime, and iron. But the Connecticut scientists give it a special boost as an inexpensive source of vitamin C.

This anti-scurvy vitamin is the one found abundantly in oranges and other citrus fruits and in tomatoes and raw cabbage as well as in other fruits and vegetables. In winter, diets of northern families are especially likely to run low on this vitamin, so they are advised to take advantage of the good supply furnished by kale.

Small leaves of kale are even richer in vitamin C than the large leaves, the Connecticut scientists found. They suggest stripping the leaves from their tough midribs and then tearing or cutting them in inch-size pieces for cooking.

Further cooking directions to make kale appetizing and conserve its vitamin C are as follows: Boil nine minutes in enough water to come half-way to the top of the kale. If the kale has been tenderized in the field by heavy frost, it is better when boiled only six minutes. These best cooking times were learned by taste tests made by 50 college students and teachers.

Science News Letter, December 8, 1951

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# Books of the Week

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BIOLOGICAL ANTAGONISM: The Theory of Biological Relativity—Gustav J. Martin—*Blakiston*, 516 p., $8.50. Contributing to an understanding of chemotherapy.

BORN OF THOSE YEARS: An Autobiography—Perry Burgess—*Holt*, 307 p., illus., $4.00. The president of the Leonard Wood Memorial tells of a life spent fighting leprosy all over the world.

COME TO THE CITY—Ruth M. Tensen—*Reilly and Lee*, 42 p., illus., $2.00. This reader for first- and second-graders, illustrated with handsome photographs, introduces the country child to life in the city.

CONFERENCE ON PROBLEMS OF AGING—Nathan W. Shock, Ed.—*Macy*, 194 p., illus., $4.00. Conference papers by specialists from widely different fields, together with the discussion following each.

CONTRIBUTIONS TO EMBRYOLOGY: Volume XXXIV, Nos. 222 to 230—*Carnegie Institution*, 196 p., illus., paper, $8.75 (cloth, $9.50). Another volume of technical papers by workers in this field.

CURARE AND ANTI-CURARE AGENTS—K. R. Unna and others—*New York Academy of Sciences*, Annals, Vol. 54, Art. 3, 240 p., illus., paper, $4.00. Originally an Indian arrow poison, curare is now helpful in prolonging life.

EFFECT OF SOIL TREATMENTS WITH DDT, BENZENE HEXACHLORIDE, AND TOXAPHENE ON TOBACCO, COTTON, AND COWPEAS—Norman Allen and others—*Govt. Printing Office*, USDA Technical Bulletin No. 1047, 22 p., illus., paper, 15 cents. These insecticides, when used too heavily or continuously, affect not only the growth of plants but sometimes the taste or other characteristics of the crops; the experiments reported here give an idea how much can be safely used.

ESSENTIALS IN PROBLEM SOLVING—Zuce Kogan—*Zuce Kogan*, 79 p., illus., $3.00. Designed by the author, a consulting engineer, to provide practical aids in solving the problems of daily life.

FACING THE FACTS ABOUT CANCER—Dallas Johnson—*Public Affairs Committee*, Rev. ed., 32 p., illus., paper, 20 cents. The American Cancer Society and The National Cancer Institute join to present facts everyone should know about this disease.

HEAVENS ON EARTH: Utopian Communities in America 1680-1880—Mark Holloway—*Library Publishers*, 240 p., illus., $4.75. The Oneida community was far from the only attempt at a perfect society, with peculiar customs and cultures. We are still forming Utopias.

INCENTIVE MANAGEMENT: A New Approach to Human Relationships in Industry and Business—James F. Lincoln—*Lincoln Electric Company*, 280 p., $1.00. Describing the author's system of rewards and penalties based on workers' records, as opposed to collective bargaining.

LIQUID EXTRACTION—Robert E. Treybal—*McGraw*, 415 p., illus., $7.50. A text for self-instruction as well as for class use.

MONKEYS AS PETS—Leonore Brandt—*All-Pets Magazine*, 96 p., illus., $2.00. Information about the care of these pleasant, somewhat emotional pets by the curator of the Cincinnati Children's Zoo.

PRICES OF APPAREL WOOL—Albert M. Hermie—*Govt. Printing Office*, USDA Technical Bulletin No. 1041, 48 p., paper, 20 cents. The world conditions of supply and demand and how they determine the price of wool in this country.

STRUCTURE AND TAXONOMIC VALUE OF THE DEWLAP IN SUGARCANE—Ernst Artschwager—*Govt. Printing Office*, USDA Technical Bulletin No. 1033, 12 p., illus., paper, five cents. Different types of sugarcane can be distinguished according to the shape and development of the dewlap or joint triangle.

Science News Letter, December 8, 1951

GENERAL SCIENCE

# Some Try for Low Mark

➤ A "SIGNIFICANT NUMBER" of draft inductees are flunking the Armed Forces Qualification Test—the Army's mental test—but are being passed anyway. The conclusion to be drawn is that most, but not all, the inductees who flunk but are administratively passed, deliberately tried for a low mark so they would not have to serve.

The Armed Forces Examining Station Policy Board passes inductees on the basis of their background. Men who graduated from high school, for instance, are in, no matter how low a mark they get on the test.

The actual number who flunk but who are administratively passed is classified information. Efforts to have it declassified on the grounds that this had nothing to do with national security, failed.

Selective Service headquarters has claimed that a very high percentage of the men they send to Army induction centers are turned back because they fail the mental test. Gen. Lewis H. Hershey has used a percentage of 50% for those turned back for either physical or mental reasons, but can provide no breakdown into the two categories.

This information is also classified by the Army.

However, Defense Department representatives claim that draft inductees are not a representative sample of the population. In a period of one year, they point out, more men enlisted voluntarily than were drafted. Students are not in the draftee group, either, and, until recently, married men were not a part of the group.

This means, they say, that it is to be expected that a high percentage of draftees would flunk either their physical or mental tests. The standards for acceptance, they claim, are now as low as during the peak of World War II.

Science News Letter, December 8, 1951

INVENTION

## Lights on Shoes for Well-Dressed Boy

➤ RAY GUN in hand, superman sweater on, Hopalong Cassidy pistols at the belt, atomic disintegrator slung over shoulder and Roy Rogers cowboy hat on head—all this does not by any means complete the costume of the well dressed all-American boy. Now he has to have lights on his shoes. What's more, the lights must go on and off as he walks—or more correctly—runs around.

For inventing this illuminated shoe device, Nathan Rikelman, Bronx, N. Y., received patent 2,572,760—and the gratitude of the nation's fathers and mothers.

Science News Letter, December 8, 1951

RADIO

## Turn Missiles Back on Enemy Is Future Hope

➤ OUR AIR Force might one day be able to turn enemy guided missiles in the air and send them back to attack the enemy which directed them at our shores in the first place.

The ability to do this, if it is achieved, is based on the simple fact that guided missiles are controlled in flight by radio signals. If we can hit upon the signals used to guide the missiles, we can guide them right back where they came from.

If we cannot make boomerangs out of the missiles, we might be able to confuse them. Jamming of the radio signals used by the enemy in steering the missiles to choice American targets would do the trick and perhaps cause them to crash before they reach their intended targets.

Of course, what the enemy can do to our guided missiles is a problem to worry our scientists. ORDNANCE (Nov.-Dec.) reports that developers of our guided missiles are known to have given great attention to methods which would foil enemy attempts either to jam our signals or to take over control of our missiles in the air.

Public announcement of the "Matador," new combat guided missile, states the magazine, must mean that our Air Force has reason to believe it can foil enemy attempts at jamming or stealing our guided missiles.

Science News Letter, December 8, 1951

PUBLIC HEALTH

# Stop Korean Louse

**Two chemicals that will stop Korean body louse, carrier of deadly typhus fever, found. Insect is not only resistant to, but thrives on, DDT.**

➤ A CHEMICAL that will stop the Korean body louse, carrier of deadly typhus fever, which resists DDT, has been found by a U. S. Department of Agriculture scientist, Dr. Gaines W. Eddy.

In fact, Dr. Eddy has found two chemicals that stop this variety of body louse.

Some has already been shipped to Korea and more is on the way to protect our fighting men.

The chemicals are lindane and pyrethrum. One is as effective as the other against this louse, and Army medical scientists find that both are safe for use as a dusting powder for humans.

Discovery by Navy and Army doctors a month ago that the Korean body louse was resistant to DDT and even thrived on it aroused considerable concern. Since World War II, DDT has been relied on as a weapon against typhus fever because it kills the lice that spread the disease. An anti-typhus vaccine has been developed and our troops are given this protection, but dusting with DDT powder has been the chief reliance for stopping typhus epidemics among large groups of unvaccinated persons.

Typhus fever has broken out among the South Korean population and among prisoners of war. So far, these outbreaks have not gotten out of hand. But military authorities can breathe easier, now that they have two new chemicals effective against the Korean louse.

The chemicals will be used first for mass dusting of prisoners of war, to stop danger of infected lice spreading from them. United Nations troops will get individual two-ounce cans for their personal protection, And as soon as enough of the powders can be made and shipped, they will be distributed to the South Korean population.

Further studies on the problem continue, to see whether other areas of the world may need either of these powders. So far, only the Korean body louse has been resistant to DDT. Even head lice in Korea are killed by this old stand-by.

Cooperating with Dr. Eddy in discovering the answer to the Korean louse problem were the 37th Army Preventive Medicine Company and the Navy's Fleet Epidemic Disease Control Unit No. One.

Science News Letter, December 8, 1951

MEDICINE

# Ovaries Transplanted

➤ FOUR GENERATIONS of mice born of a strange kind of foster mothering at the Jackson Laboratory in Bar Harbor, Me., are giving scientists new knowledge of the relation between glands and cancer. The foster mothering was done in the following way:

The ovary containing the egg cells from which the mice developed was first grafted into the spleen of the mouse that owned the ovary. In a sense, this mouse was the real mother. Then, after periods up to 60 days, the ovary and egg cells were removed from the spleen and transplanted into the body of another mouse which had had one of its ovaries removed.

The second mouse was mated and in some cases gave birth to a baby from the transplanted ovary. Whether the baby belonged to the second mouse or had been fostered by her through the ovarian graft could be told by its "dilute brown" coat color. This is a genetic tag for one of the famous Jackson Laboratory strains of inbred mice which have been absolutely identical for more than 230 generations.

The young mice so strangely mothered showed no hereditary changes for at least four generations. This is considered of great importance in the study of the relationship of glandular imbalance to cancer.

It has been known for some time that when ovaries are transplanted into spleens of castrated mice and allowed to stay there for long periods, some of the ovaries become cancerous. This is thought to be because hormones from the ovary in the spleen are inactivated in the liver and do not reach the general blood circulation as they normally do. It has been suggested that the same mechanism is responsible for ovarian tumors induced in experimental animals by X-rays.

The ovaries that stayed in spleens for some time and then were regrafted apparently lost the ability to produce egg cells that could become new mice, because only half the mothers that got these transplanted ovaries had litters. But the young they did have were not abnormal and the foster mothering mice did not show any adverse effects from the ovaries that had been out of their normal environment for long periods.

These studies, part of an extensive study of the whole subject of the relation of gland, or hormone, imbalance to cancer, are reported by Drs. Clarence C. Little and Katharine P. Hummel and Miss Mary Eddy and Miss Barbara Rupple in the PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES (Oct.).

Science News Letter, December 8, 1951

TECHNOLOGY

## Massive Machines Weighed By Electronic Crane Scales

➤ THE WEIGHT of massive objects too heavy to be weighed by ordinary devices is now being determined with what are called electronic crane scales which utilize a resistance wire strain gage, an electric current and an electronic indicator.

This weighing device is in use by General Electric Company to determine the weight of giant electrical transformers. The resistance wire strain gages are a product of Baldwin-Lima-Hamilton Corporation of Philadelphia. Employed are strain gage load cells of 300,000 pounds capacity.

The gage is set in the upper part of a gigantic double crane hook to which the object being weighed is suspended. It is a small cell which contains a grid of wire finer than human hair. The gage is subjected to strain transmitted to it by a short load-supporting column to the side of which the gage is cemented. It is above the cross bar which carries the hook, so that the strain on it is compression.

Imperceptible compression of the column under load reduces the length of the wire in the grids also. This changes their electrical resistance enough to be detected and measured by electronic circuits to which they are connected. Readings are made on a portable indicator to which the gage is attached by electric wire.

This portable weight indicator and accessory reels of electric cord for connection to load cell units and convenient electric power outlet is moved about on rubber-tired wheels. The indicator translates directly into pounds or tons on its dial.

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*FOOT MOP, a recently patented device for the housewife to use in dry mopping or polishing floors, fits like a slipper on the shoeless foot and is manipulated by leg-power. The slipper part is made of cloth so that it can be washed, and the mop itself is so shaped that it can get into corners.*

Science News Letter, December 8, 1951

*COMBINATION TOOL, recently patented, combines the features of a hammer, a pair of pliers and a wire-cutter. It can also be used for tightening a wire in a concrete form. It is designed for use in the construction of concrete forms but is suitable for many purposes.*

Science News Letter, December 8, 1951

*CHEMICAL PUMP, to use on carboys and other large glass containers of corrosive liquids, is made of heavy Pyrex glass tubing and will handle almost all solvents, acids, alkalies and liquid organic materials. The pump prevents contamination because it is left in a container until the carboy is empty.*

Science News Letter, December 8, 1951

*HEX TENTS, now in Korea ready for use to keep soldiers warm in sub-zero weather, are six-sided in shape and accommodate five men. Important feature is a white lining that provides insulation and reflects light better than the usual tent. It also prevents frost from falling on the occupants.*

Science News Letter, December 8, 1951

*DUMPABLE ASH tray, for use in an automobile, is held inside a hinged vent window, pivoted to a metal clasp that grips the vertical edge of the glass. To empty the tray while driving, one merely opens the vent window and tilts the tray outward with a flick of a finger, as shown in the photograph.*

Science News Letter, December 8, 1951

*VIBRATION TEST tower, used by an airplane company in the study of vibration effects on aircraft parts, stands 40 feet high, is 15 feet square and can shake objects weighing up to 3,000 pounds. It gives them up to 15 shakes a second with each motion up to five feet in length.*

Science News Letter, December 8, 1951

*TINY ASH tray, to clip to the side of a saucer or plate on the dining table, is curved in shape, made of aluminum and held by a plastic framework with two prongs to grasp the edge of the chinaware. These inexpensive ash trays come in sets and in various colors.*

Science News Letter, December 8, 1951

*AIR RAID SIREN, that can be heard over seven miles away under ordinary conditions, has a 140-horsepower engine and a blower that emits winds up to 375 miles per hour. A six-bladed rotary chopper interrupts the flow of air passing to six horns, thus creating the noise.*

Science News Letter, December 8, 1951

## Do You Know?

The herring family provides about 21% of the *fish* caught in the sea.

Lenses in *eyeglasses* for far-sighted persons are convex, or magnifying; for near-sighted persons a concave or reducing lens is used.

Fluorescent *dyes*, now used for coloring yarns and fabrics, are made of translucent substances that fluoresce, or glow, when hit by the invisible ultraviolet rays of daylight.

The *dog* population of the United States is approximately 22,000,000.

"Pigskin" is not a correct name for a *football* because nearly all footballs are made of cattlehide.

Brazil has plenty of *titanium*, mostly in the form of rutile which is 95% titanium oxide.

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